



## Complete Summary

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### GUIDELINE TITLE

Evidence-based clinical practice guideline for medical management of bronchiolitis in infants less than 1 year of age presenting with a first time episode.

### BIBLIOGRAPHIC SOURCE(S)

Cincinnati Children's Hospital Medical Center. Evidence based clinical practice guideline for medical management of bronchiolitis in infants less than 1 year of age presenting with a first time episode. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2006 May. 13 p. [85 references]

### GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Cincinnati Children's Hospital Medical Center. Evidence based clinical practice guideline for infant with bronchiolitis. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2001 Nov 28. 9 p.

The guideline was reviewed for currency in May 2006, using updated literature searches and was determined to be current.

## COMPLETE SUMMARY CONTENT

SCOPE  
METHODOLOGY - including Rating Scheme and Cost Analysis  
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## SCOPE

### DISEASE/CONDITION(S)

Bronchiolitis

### GUIDELINE CATEGORY

Diagnosis  
Evaluation  
Management  
Prevention

#### CLINICAL SPECIALTY

Emergency Medicine  
Family Practice  
Pediatrics

#### INTENDED USERS

Advanced Practice Nurses  
Allied Health Personnel  
Health Care Providers  
Nurses  
Patients  
Physician Assistants  
Physicians  
Respiratory Care Practitioners

#### GUIDELINE OBJECTIVE(S)

In children age less than 12 completed months and presenting for the first time episode with bronchiolitis typical in presentation and clinical course, the objectives of this guideline are to:

- Decrease the use of unnecessary diagnostic studies
- Decrease the use of medications and respiratory therapy without observed improvement
- Improve the rate of appropriate admission
- Decrease the rate of nosocomial infection
- Improve the use of appropriate monitoring activities
- Decrease length of stay

#### TARGET POPULATION

These guidelines are intended for use in children:

Age less than 12 completed months and presenting for the first time episode with bronchiolitis typical in presentation and clinical course

These guidelines are not intended for use in children:

- With a history of cystic fibrosis (CF)
- With a history of bronchopulmonary dysplasia (BPD)
- With immunodeficiencies
- Admitted to an intensive care unit
- Requiring ventilator care
- With other severe comorbid conditions complicating care

## INTERVENTIONS AND PRACTICES CONSIDERED

### Prevention

1. Review of preventive measures with parents of newborns
2. Respiratory and contact isolation precautions for patients with documented bronchiolitis

### Diagnosis/Evaluation

1. Clinical history and physical examination
2. Laboratory and radiological studies (i.e., respiratory syncytial virus [RSV] swab, chest x-rays, cultures of blood or urine, capillary or arterial blood gases, rapid influenza or other rapid viral studies, pulse oximetry) not for routine use

### Management

1. Oxygen therapy
2. Epinephrine or albuterol
  - No routine scheduled or serial use of albuterol aerosol therapies
  - Single administration trial inhalation using epinephrine or albuterol in selected patients
  - Repeated or continued use only if improvement is documented
3. Guideline developers considered but recommended against the following:
  - Antibiotics (in the absence of an identified bacterial focus)
  - Routine use of antihistamines, oral decongestants, and nasal vasoconstrictors
  - Steroid therapy given as inhalations, intravenously (IV), orally (PO), or intramuscularly (IM)
4. Respiratory care therapies
  - Suctioning before feeds as needed (PRN) and prior to each inhalation therapy
  - Normal saline drops prior to suctioning

Note: Guideline developers considered but recommended against the following routine respiratory care therapies: chest physiotherapy, cool mist therapy, aerosol therapy with saline.

5. Monitoring of clinical status
  - Repeated clinical assessments
  - Cardiac and respiratory rate monitoring during acute stage
  - Spot checks of pulse oximetry
6. Discharge planning
7. Parent education
  - Basic pathophysiology and expected clinical course of bronchiolitis
  - Proper techniques for suctioning the nose and making breathing easier
  - When to call primary care provider with signs of worsening clinical status
  - Topics regarding prevention of respiratory infection

## MAJOR OUTCOMES CONSIDERED

- Clinical improvement
- Hospitalization rates
- Length of stay

## METHODOLOGY

### METHODS USED TO COLLECT/SELECT EVIDENCE

#### Searches of Electronic Databases

### DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

To select evidence for critical appraisal by the group, the Medline, EmBase, and the Cochrane databases were searched for dates of October 2001 through October 2004 to generate an unrefined, "combined evidence" database using a search strategy focused on answering clinical questions relevant to bronchiolitis and employing a combination of Boolean searching on human-indexed thesaurus terms (Medical Subject Heading [MeSH] headings using an OVID Medline interface) and "natural language" searching on words in the title, abstract, and indexing terms. The citations were reduced by eliminating duplicates, review articles, non-English articles, and adult articles. The resulting abstracts were reviewed by a methodologist to eliminate low quality and irrelevant citations. During the course of the guideline development and revision, additional clinical questions were generated and subjected to the search process, and some relevant review articles were identified. August 2001 was the last date for which literature was searched for the previous version of the guideline. The details of previous review strategies are not documented. However, all citations carried from an earlier version were reviewed for appropriateness to this revision.

#### May 2006 Review

A search using the above criteria was conducted for dates of November, 2004 through May, 2006. Thirty-one relevant articles were selected as potential future citations for the guideline. However, none of these references were determined to require changes to the 2005 version of the recommendations.

### NUMBER OF SOURCE DOCUMENTS

238

### METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Not stated

### RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

### METHODS USED TO ANALYZE THE EVIDENCE

Review  
Review of Published Meta-Analyses

#### DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

#### METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

#### DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Recommendations have been formulated by a consensus process directed by best evidence, patient and family preference, and clinical expertise. During formulation of these recommendations, the team members have remained cognizant of controversies and disagreements over the management of these patients. They have tried to resolve controversial issues by consensus where possible and, when not possible, to offer optional approaches to care in the form of information that includes best supporting evidence of efficacy for alternative choices.

#### RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

#### COST ANALYSIS

The use of palivizumab has not been shown to be cost-effective in children regardless of prematurity or the presence of congenital heart disease due to the high cost of the medication and persistently low mortality rates associated with respiratory syncytial virus (RSV)-bronchiolitis.

#### METHOD OF GUIDELINE VALIDATION

External Peer Review

#### DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

The guidelines have been reviewed and approved by clinical experts not involved in the development process, senior management, Risk Management & Corporate Compliance, the Institutional Review Board, other appropriate hospital committees, and other individuals as appropriate to their intended purposes.

### RECOMMENDATIONS

#### MAJOR RECOMMENDATIONS

Each recommendation is followed by evidence classification (A-X) identifying the type of supporting evidence. Definitions for the types of evidence are presented at the end of the "Major Recommendations" field.

## Prevention

### General

Infants less than three months of age, premature infants (<35 weeks gestation), and infants with chronic lung disease, congenital heart disease, or immune deficiency syndromes who are diagnosed with bronchiolitis may be at particular risk for hospitalization and significant morbidity (Shay et al., 2001 [D]; Boyce et al., 2000 [D]; Joffe et al., "Rehospitalization," 1999 [D]; Church et al., 1984 [D]; Shay et al., 1999 [O]). Prevention of hospitalization and significant morbidity is a high priority in the management of this lower respiratory tract infection.

### Prevention Measures

1. It is recommended that measures to prevent acute bronchiolitis be reviewed with parents of newborns prior to discharge from the hospital and at follow-up visits in the first years of life. These specific measures include:
  - Eliminating exposure to environmental tobacco smoke (Mahabee-Gittens, 2002 [O]).
  - Limiting exposure to contagious settings and siblings (e.g., daycare centers)
  - An emphasis on handwashing in all settings
  - Preventive medical therapies such as palivizumab (Synagis®, MedImmune) may be considered for selected high-risk patients ("Palivizumab," 1998 [A]; Celedon et al., 1999 [C]; Aitken & Taylor, 1998 [C]; Wald, Guerra, & Byers, 1991 [C]).

Note: A large, multicenter double-blind, randomized, controlled trial has shown that palivizumab (Synagis®, MedImmune) reduced the rates of hospitalization (not acute infection) for all infants studied, premature infants (<35 weeks) less than six months of age, and infants with bronchopulmonary dysplasia (BPD) by 55%, 78%, and 39% respectively. The use of palivizumab has not been shown to be cost-effective in children regardless of prematurity or the presence of congenital heart disease due to the high cost of the medication and persistently low mortality rates associated with respiratory syncytial virus (RSV)-bronchiolitis ("Palivizumab," 1998 [A]; Heikkinen et al., 2005 [C]; Wegner et al., 2004 [C]; Shay et al., 2001 [D]; Yount & Mahle, 2004 [Q]; Joffe et al., "Cost-effectiveness," 1999 [Q]).

2. It is recommended, in patients with documented bronchiolitis, that masks covering the nose and eyes be worn and that contact isolation, including vigorous handwashing, be performed before and after entering the exam room (Hall et al., 1981 [C]; Hall, 2001 [S]; Local Expert Consensus [E]).

Note 1: Viral transmission occurs by direct inoculation of contagious secretions from the hands or by large-particle aerosols into the eyes and nose, but rarely the mouth (Hall et al., 1981 [C]; Hall, 2001 [S]; Local Expert Consensus [E]).

Note 2: Nosocomial infection may place medically fragile infants and children at increased risk for morbidity and mortality upon exposure to the hospital environment (Langley et al., 1997 [C]).

Note 3: Follow Respiratory/Contact precautions as described for bronchiolitis in the Cincinnati Children's Hospital Medical Center (CCHMC) Infection Control Manual (ICRM-735) (Local Expert Consensus [E]).

## Assessment and Diagnosis

### Clinical History and Physical Examination

3. It is recommended that the clinical history and physical examination be the basis for a diagnosis of bronchiolitis.

The diagnosis of bronchiolitis and its severity is rooted in the clinician's interpretation of the constellation of characteristic findings and is not dependent on any specific clinical finding or diagnostic test (Bordley et al., 2004 [M]). Infants with acute bronchiolitis may present with a wide range of clinical symptoms and severity, from mild upper respiratory infections (URI) to impending respiratory failure.

Diagnostic criteria for bronchiolitis include, but are not limited to, the following:

- Preceding upper respiratory illness and/or rhinorrhea
- Signs of respiratory illness which may include the following common upper respiratory infection symptoms:
  - wheezing
  - retractions
  - shortness of breath
  - low oxygen (O<sub>2</sub>) saturation
  - tachypnea
  - color change
  - nasal flaring
- Signs of dehydration
- Exposure to persons with viral upper respiratory infection

### Laboratory and Radiologic Studies

4. It is recommended that routine diagnostic studies (RSV swab, chest x-rays, cultures, capillary or arterial blood gases, rapid influenza or other rapid viral studies) not be performed to determine viral infection status or to rule out serious bacterial infections. Such studies are not generally helpful and may result in increased rates of unnecessary admission, further testing, and unnecessary therapies (Bordley et al., 2004 [M]; Swinger, Hussey, & Zwarenstein, 1998 [A]; El-Radhi, Barry, & Patel, 1999 [C]; Kuppermann et al., 1997 [C]; Liebelt, Qi, & Harvey, 1999 [D]; Antonow et al., 1998 [D]; Schwartz, 1995 [S]; Chiocca, 1994 [S]; Lugo & Nahata, 1993 [S]; Stark & Busse, 1991 [S]).

Note 1: Chest x rays may be obtained as clinically indicated when the diagnosis of bronchiolitis is not clear (Swingler, Hussey, & Zwarenstein, 1998 [A]; El-Radhi, Barry, & Patel, 1999 [C]).

Note 2: Capillary or arterial blood gases and pulse oximetry may be obtained as clinically indicated for individual patients (Local Expert Consensus [E]).

Note 3: In selected very young infants, establishing a source through rapid viral testing may prevent unnecessary additional workup (Bordley et al., 2004 [M]).

## Management

### General

The basic management of typical bronchiolitis is anchored in the provision of therapies that assures that the patient is clinically stable, well oxygenated, and well hydrated. The main benefits of hospitalization of infants with acute bronchiolitis are:

- The careful monitoring of clinical status
- Maintenance of a patent airway (through positioning, suctioning, and mucus clearance)
- Maintenance of adequate hydration
- Parental education

(Klassen, 1997 [S]; Lugo & Nahata, 1993 [S]; Panitch, Callahan, & Schidlow, 1993 [S]; Nicolai & Pohl, 1990 [S]; Local Expert Consensus [E]).

### Medications and Oxygen

5. It is recommended to consider starting supplemental oxygen when the saturation is consistently less than 91% and consider weaning oxygen when consistently higher than 94% (National Institutes of Health (NIH), 1997 [E]; Local Expert Consensus [E]).

Oxygen therapy is frequently required in the treatment of bronchiolitis. See Monitoring section for recommendation regarding oxygen saturation monitoring to maintain blood oxygen levels within a normal range. This range is variable in definition and patient-specific.

6. It is recommended that scheduled or serial albuterol aerosol therapies not be routinely used (Kellner et al., 2005 [M]; Flores & Horwitz, 1997 [M]; Kellner et al., 1996 [M]; Goh et al., 1997 [A]; Dobson et al., 1998 [B]; Chowdhury et al., 1995 [B]; Lugo, Salyer, & Dean, 1998 [C]; Lenney & Milner, 1978 [D]).

Note 1: Although in some cases bronchiolitis may be a prelude to asthma (Martinez et al., 1995 [C]; Stark & Busse, 1991 [S]), in the majority of cases the use of inhalation therapies and other treatments effective for treating the bronchospasm characteristic in asthma will not be efficacious for treating the airway edema typical of bronchiolitis (Hall, 2001 [S]; Klassen, 1997 [S]).



Note 2: Two meta-analyses of randomized, controlled trials have not shown dramatic effects on clinical scores or hospitalization rates from therapy with nebulized albuterol in children with bronchiolitis (Flores & Horwitz, 1997 [M]; Kellner et al., 1996 [M]).

Note 3: Deterioration and desaturation has been associated with inhalation therapies (Flores & Horwitz, 1997 [M]; Ho et al., 1991 [B]).

7. It is recommended that a single administration trial inhalation using epinephrine or albuterol may be considered as an option, particularly when there is a family history for allergy, asthma, or atopy (Hartling et al., 2003 [M]; Klassen, 1997 [S]).

Note 1: Nebulized racemic epinephrine was shown to result in better improvement in pulmonary physiology and clinical scores compared with albuterol or placebo in several studies and one systematic review. These effects predominated in mildly ill children and were transient (30 to 60 minutes) in duration (Hartling et al., 2003 [M]; Wainwright et al., 2003 [A]; Numa, Williams, & Dakin, 2001 [O]).

Note 2: See Respiratory Care Therapy section regarding the importance of suctioning before any inhalation therapy.

Note 3: The expected disposition of a patient may influence the choice of beta-agonist when a single administration trial is given. There is a lack of research regarding the appropriateness of routine epinephrine use outside the acute care setting (Local Expert Consensus [E]).

8. It is recommended that inhalation therapy not be repeated nor continued if there is no improvement in clinical appearance between 15 to 30 minutes after a trial inhalation therapy (Klassen, 1997 [S]; Bausch & Lomb Pharmaceuticals, 1999 [O]).

Note: In order to determine appropriateness of repeated therapy, use the [Bronchiolitis Respiratory Sheet](#) to record pre- and post-clinical score (Conway et al., 2004 [C]).

9. It is recommended that antibiotics not be used in the absence of an identified bacterial focus.

Note 1: The incidence of serious bacterial illness (SBI) has been reported to be less than 2% in bronchiolitis patients 60 days of age or younger (Friis et al., 1984 [B]; Kuppermann et al., 1997 [C]; Purcell & Fergie, 2004 [D]; Purcell & Fergie, 2002 [D]; Liebelt, Qi, & Harvey, 1999 [D]; Antonow et al., 1998 [D]). See the National Guideline Clearinghouse (NGC) summaries of the following CCHMC Evidence Based Clinical Practice Guidelines [Evidence Based Clinical Practice Guideline for Fever of Uncertain Source in Infants 60 Days of Age or Less](#) or [Evidence Based Clinical Practice Guideline for Fever of Uncertain Source in Children 2 to 36 Months of Age](#), [Evidence Based Clinical Practice Guideline for Medical Management of Acute Otitis Media in Children 2 Months to 13 Years of Age](#), and [Evidence Based Clinical Practice Guideline for](#)

## Medical Management of First Time Acute Urinary Tract Infection in Children 12 Years of Age or Less.

Note 2: In almost 75% of patients with RSV infections, the virus may be isolated from the middle ear (Heikkinen, Thint, & Chonmaitree, 1999 [C]; Andrade et al., 1998 [C]; Pitkaranta et al., 1998 [C]). In patients with RSV and otitis media, a bacterial pathogen has been isolated in 25 out of 26 (Andrade et al., 1998 [C]) and one out of eight (Pitkaranta et al., 1998 [C]) middle ear fluid specimens after tympanocentesis.

Note 3: Antibiotics have little, if any, effect on outcomes from otitis media (Glasziou et al., 2005 [M]; Marcy et al., 2001 [M]; Del Mar, Glasziou, & Hayem, 1997 [M]; Rosenfeld et al., 1994 [M]).

10. It is recommended that antihistamines, oral decongestants, and nasal vasoconstrictors not be used for routine therapy.

Note 1: There is no evidence to date for efficacy of these medications in reduction of cough or congestion in infants with upper and lower respiratory tract infections (Clemens et al., 1997 [B]; Hutton et al., 1991 [B]; "Use of codeine," 1997 [S]; Gadomski & Horton, 1992 [O]).

Note 2: Some components of these medications have been shown to be harmful to humans (Kernan et al., 2000 [D]).

11. It is recommended that steroid therapy not be given (as inhalations, intravenously, orally, or intramuscularly) (King et al., 2004 [M]; Garrison et al., 2000 [M]).

Note: One well-conducted systematic review found a reduction in length of stay of 0.43 days (95% confidence interval [CI] 0.8 to 0.05) with steroid therapy for bronchiolitis (Garrison et al., 2000 [M]). However, when only the more methodologically rigorous studies with more specific definitions of bronchiolitis were analyzed in this meta-analysis, there was no significant effect of steroids on clinical status or length of stay.

### Respiratory Care Therapy

12. It is recommended the infant be suctioned, when clinically indicated:
- Before feedings
  - As needed (PRN)
  - Prior to each inhalation therapy

(Local Expert Consensus [E])

In order to appropriately measure improvement in clinical status due to the therapeutic effects of the medication, the following reasons for suctioning are considered:

- Suctioning itself may improve respiratory status such that inhalation therapy is not necessary. Thus, it is important to document the pre- and post-suction clinical score prior to treatment.
- Suctioning may improve the delivery of the inhalation treatment.

(Local Expert Consensus [E]).

Note: Normal saline nose drops may be used prior to suctioning (Local Expert Consensus [E]).

13. It is recommended that other routine respiratory care therapies not be used, as they have not been found to be helpful. These include:
- Chest physiotherapy (CPT) (Perrotta, Ortiz, & Roque, 2005 [M])
  - Cool mist therapy (Gibson, 1974 [S])
  - Aerosol therapy with saline (Gadomski et al., 1994 [A]; Chowdhury et al., 1995 [B]; Ho et al., 1991 [B]).

## Monitoring

14. It is recommended that repeated clinical assessment be conducted, as this is the most important aspect of monitoring for deteriorating respiratory status (Local Expert Consensus [E]).
15. It is recommended to consider cardiac and respiratory rate monitoring in hospitalized patients during the acute stage of bronchiolitis when the risk of apnea and/or bradycardia is greatest (Anas et al., 1982 [C]; Church et al., 1984 [D]).

Note 1: Premature infants, infants with underlying chronic conditions, and infants less than three months of age who contract RSV are at particular risk of severe complications such as apnea and mechanical ventilation (Wang, Law, & Stephens, 1995 [C]; Anas et al., 1982 [C]; Krasinski, 1985 [D]; Church et al., 1984 [D]).

Note 2: Several studies have reported more severe progression of disease in children with bronchiolitis who present with low initial oxygen saturations (Wang, Law, & Stephens, 1995 [C]; Shaw, Bell & Sherman, 1991 [C]; Mulholland, Olinsky, & Shann, 1990 [D]).

16. It is recommended that scheduled spot checks of pulse oximetry be utilized in infants with bronchiolitis (Local Expert Consensus [E]).

Note 1: Continuous oximetry measurement has been associated with increased length of stay of 1.6 days (95% CI, 1.1 to 2.0) on average (Schroeder et al., 2004 [D]).

Note 2: Wide variability has been demonstrated in the manner in which clinicians use and interpret pulse oximetry readings in children with bronchiolitis. This variability has been shown to be associated with increased preferences for hospital admission and increased length of stay for children admitted with bronchiolitis (Schroeder et al., 2004 [D]; Mallory et al., 2003 [O]).

Note 3: In a prospective study of healthy, term infants, transient oxygen desaturation episodes were documented and were determined to be representative of normal breathing and oxygenation behavior. This study excluded any decreases in oxygen saturation related to the infants' movement which would interfere with measurement (Hunt et al., 1999 [C]).

### Discharge Criteria

17. It is recommended to begin discharge planning on admission (Local Expert Consensus [E]). Discharge criteria are:

#### Respiratory Status

- Respirations less than 70 per minute and no clinical evidence of increased work of breathing
- Parent can clear the infant's airway using bulb suctioning.
- Patient is either on room air or on stable oxygen therapy that is at a level considered consistent with being able to effectively continue the therapy at home.

#### Nutritional Status

- The patient is on oral feedings at a level to prevent dehydration.

#### Social

- Home resources are adequate to support the use of any necessary home therapies.
- Parent or guardian is confident they can provide care at home.
- Family education complete

#### Follow Up

- When indicated, home care and durable medical supply (DMS) agencies have been notified and arrangements for visits finalized.
- Primary care provider identified, notified, and agrees with discharge decision
- Follow-up appointments have been scheduled.

### Education

18. It is recommended that the family be educated on the following topics regarding the care of a child with bronchiolitis:

- Basic pathophysiology and expected clinical course of bronchiolitis

Note: The median duration of illness for children <24 months with bronchiolitis is 12 days; after 21 days approximately 18% will remain ill, and after 28 days 9% will remain ill (Swingler, Hussey, & Zwarenstein, 2000 [C]).

- Proper techniques for suctioning the nose and making breathing easier (Local Expert Consensus [E])

- To call their primary care provider when the following signs of worsening clinical status are observed (Local Expert Consensus [E]).
  - a. increasing respiratory rate and/or work of breathing as indicated by accessory muscle use
  - b. inability to maintain adequate hydration
  - c. worsening general appearance

19. It is recommended that the family be educated on the following topics regarding prevention of respiratory infection in infants:

- Eliminating exposure to environmental tobacco smoke (Mahabee-Gittens, 2002 [O])
- Limiting exposure to contagious settings and siblings (e.g., daycare centers) (Celedon et al., 1999 [C])
- An emphasis on handwashing in all settings (Hall et al., 1981 [C])

#### Definitions:

#### Evidence Grading Scale:

A: Randomized controlled trial: large sample  
 B: Randomized controlled trial: small sample  
 C: Prospective trial or large case series  
 D: Retrospective analysis  
 E: Expert opinion or consensus  
 F: Basic laboratory research  
 S: Review article  
 M: Meta-analysis  
 Q: Decision analysis  
 L: Legal requirement  
 O: Other evidence  
 X: No evidence

#### CLINICAL ALGORITHM(S)

An algorithm is provided in the original guideline document for the medical management of bronchiolitis in infants less than 1 year of age presenting with a first time episode.

### EVIDENCE SUPPORTING THE RECOMMENDATIONS

#### REFERENCES SUPPORTING THE RECOMMENDATIONS

[References open in a new window](#)

#### TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is identified for the recommendations (see "Major Recommendations" field).

#### Evidence Grading Scale:

- A: Randomized controlled trial: large sample
- B: Randomized controlled trial: small sample
- C: Prospective trial or large case series
- D: Retrospective analysis
- E: Expert opinion or consensus
- F: Basic laboratory research
- S: Review article
- M: Meta-analysis
- Q: Decision analysis
- L: Legal requirement
- O: Other evidence
- X: No evidence

## BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

### POTENTIAL BENEFITS

- Decreased use of unnecessary diagnostic studies
- Decreased use of medications and respiratory therapy without observed improvement
- Improved rate of appropriate admission
- Decreased rate of nosocomial infection
- Improved use of appropriate monitoring activities
- Decreased length of stay

### POTENTIAL HARMS

Wide variability has been demonstrated in the manner in which clinicians use and interpret pulse oximetry readings in children with bronchiolitis. This guideline's recommendations seek to reduce this variability in order to limit the associated increased preferences for hospital admission and increased length of stay for children admitted with bronchiolitis, but with the trade-off of not observing or managing transient hypoxia.

## QUALIFYING STATEMENTS

### QUALIFYING STATEMENTS

These recommendations result from review of literature and practices current at the time of their formulations. This protocol does not preclude using care modalities proven efficacious in studies published subsequent to the current revision of this document. This document is not intended to impose standards of care preventing selective variances from the guidelines to meet the specific and unique requirements of individual patients. Adherence to this pathway is voluntary. The physician in light of the individual circumstances presented by the patient must make the ultimate judgment regarding the priority of any specific procedure.

## IMPLEMENTATION OF THE GUIDELINE

### DESCRIPTION OF IMPLEMENTATION STRATEGY

Appropriate companion documents have been developed to assist in the effective dissemination and implementation of the guideline.

### IMPLEMENTATION TOOLS

Chart Documentation/Checklists/Forms  
Clinical Algorithm  
Patient Resources  
Quick Reference Guides/Physician Guides

For information about [availability](#), see the "Availability of Companion Documents" and "Patient Resources" fields below.

## INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

### IOM CARE NEED

Getting Better  
Staying Healthy

### IOM DOMAIN

Effectiveness  
Patient-centeredness

## IDENTIFYING INFORMATION AND AVAILABILITY

### BIBLIOGRAPHIC SOURCE(S)

Cincinnati Children's Hospital Medical Center. Evidence based clinical practice guideline for medical management of bronchiolitis in infants less than 1 year of age presenting with a first time episode. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2006 May. 13 p. [85 references]

### ADAPTATION

Not applicable: The guideline was not adapted from another source.

### DATE RELEASED

1996 (revised 2005 Oct 15; reviewed 2006 May)

### GUIDELINE DEVELOPER(S)

Cincinnati Children's Hospital Medical Center - Hospital/Medical Center

#### SOURCE(S) OF FUNDING

Cincinnati Children's Hospital Medical Center

#### GUIDELINE COMMITTEE

Bronchiolitis Team

#### COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Bronchiolitis Team Members 2005

Community Physician: \*Chris Bolling, MD, Chair, Community Physician

Cincinnati Children's Hospital Medical Center Physicians: \*Michael Farrell, MD, Gastroenterology, Chief of Staff; \*Scott Reeves, MD, Emergency Medicine; Julia Kim, MD, Chief Resident; Indi Trehan, MD, MPH, Resident; Amy Cenedella, MD, Chief Resident

Nursing/Patient Services: \*Shirley Salway, RN, Inpatient Unit

Respiratory Therapy: \*Scott M. Pettinichi, MEd, RRT, RCP (Clinical Director, Respiratory Care); \*Edward Conway, RRT (Certified Asthma Educator)

Division of Health Policy Clinical Effectiveness Support: Edward Donovan, MD, Neonatology, Med. Dir., Clin. Eff.; \*Kieran Phelan, MD, General Pediatrics; \*Eloise Clark, MPH, MBA, Facilitator; Eduardo Mendez, RN, MPH, Dir. Evidence Based Care; Detrice Barry, RN, MSN, Education Coordinator; Deborah Hacker, RN, Medical Reviewer; \*Kate Rich, Analyst

All Team Members and Clinical Effectiveness support staff listed above have signed a conflict of interest declaration.

Ad hoc Advisors: \*Beverly Connelly, MD, Infectious Diseases, Assistant Director; \*Richard Ruddy, MD, Emergency Medicine, Director; \*Dorine Seaquist, RN, Patient Services, Senior VP; Mel Rutherford, Esq. Risk Management & Corp. Compliance; \*Barbarie Hill, Manager, Pratt Library

\* Member of previous Bronchiolitis Team

#### FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

The guideline was developed without external funding. All Team Members and Clinical Effectiveness support staff listed have declared whether they have any conflict of interest and none were identified.

#### GUIDELINE STATUS



This is the current release of the guideline.

This guideline updates a previous version: Cincinnati Children's Hospital Medical Center. Evidence based clinical practice guideline for infant with bronchiolitis. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2001 Nov 28. 9 p.

The guideline was reviewed for currency in May 2006, using updated literature searches and was determined to be current.

#### GUIDELINE AVAILABILITY

Electronic copies: Available in Portable Document Format (PDF) from the [Cincinnati Children's Hospital Medical Center Web site](#).

Print copies: For information regarding the full-text guideline, print copies, or evidence-based practice support services contact the Children's Hospital Medical Center Health Policy and Clinical Effectiveness Department at [HPCEInfo@cchmc.org](mailto:HPCEInfo@cchmc.org).

#### AVAILABILITY OF COMPANION DOCUMENTS

The following are available:

- Bronchiolitis. Guideline highlights. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2005 Nov. 1 p. Electronic copies: Available in Portable Document Format (PDF) from the [Cincinnati Children's Hospital Medical Center Web site](#).
- Bronchiolitis respiratory sheet. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2005 Oct. 1 p. Electronic copies: Available in Portable Document Format (PDF) from the [Cincinnati Children's Hospital Medical Center Web site](#).
- Emergency department algorithm. Cincinnati (OH): Cincinnati Children's Hospital Medical Center. 2003. 2 p. Electronic copies: Available in Portable Document Format (PDF) from the [Cincinnati Children's Hospital Medical Center Web site](#).

#### PATIENT RESOURCES

The following Health Topics are available:

- Bronchiolitis -- essential facts. Cincinnati Children's Hospital Medical Center, 2004 Sep. Electronic copies: Available from the [Cincinnati Children's Hospital Medical Center Web site](#).
- Bronchiolitis. Cincinnati Children's Hospital Medical Center, 2004 Sep. Electronic copies: Available from the [Cincinnati Children's Hospital Medical Center Web site](#).
- Suctioning the nose with a bulb syringe. Cincinnati Children's Hospital Medical Center, 2004 Aug. Electronic copies: Available from the [Cincinnati Children's Hospital Medical Center Web site](#).

- Second hand smoke dangers. Cincinnati Children's Hospital Medical Center, 2005 Jun. Electronic copies: Available from the [Cincinnati Children's Hospital Medical Center Web site](#).

The following is also available:

- Bronchiolitis: patient/family pathway. Cincinnati Children's Hospital Medical Center, 2 p. Electronic copies: Available from the [Cincinnati Children's Hospital Medical Center Web site](#).

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